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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,274	02/07/2002	Kuo-Guan Wu	WUKU3001/EM	7897

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EXAMINER

ARMSTRONG, ANGELA A

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,274

Applicant(s)

WU ET AL.

Examiner

Angela A. Armstrong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-9 is/are rejected.
- 7) ☒ Claim(s) 4-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 4 and 5 are objected to because of the following informalities: the claims include the variable μ , but do not provide a definition or description of what the variable represents.

Appropriate correction is required.

2. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form. As written the limitations of claim 8 are essentially the same as limitations in section (A) of claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruckner et al (US Patent No. 6,678,657) in view of applicant's admitted prior art.

4. Regarding claims 1-3, Bruckner discloses a noise reduction method for dividing input noise speech into a plurality of continuous frames, determining noisy speech spectrum for each frame, and partitioning frequency band into multiple sub-bands to determine clean speech spectrum from the noisy speech spectrum on each sub-band, (col. 3, lines 15-25) comprising: estimating noise spectrum of the r -th frame at k -th frequency components from the noisy speech of the r -th frame by silence detection and noise spectrum estimation (col. 3, line 26 to col. 4, line 43); estimating signal-to-noise ratio (SNR) value $SNR_r(i)$ of i -th sub-band for r -th frame (col. 3, line 26 to col. 4, line 43).

Bruckner does not teach determining an over-subtraction factor or determining the clean speech spectrum or components by performing a spectral subtraction that implements the over-subtraction factor.

Applicant's admitted prior art at page 2, line 12 and continuing to page 3, line 6 of the specification, identifies that it was well known in the art to over-subtract the noise spectrum estimate, such that the traditional spectral subtraction calculation is modified to include the over-subtraction factor (α), and the factor is determined based on the signal-to-noise ratio (SNR), for the purpose of reducing the effect of musical noise on the estimate of the clean speech.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Bruckner, to implement an over-subtraction factor in the spectral subtraction, as was well known in the art as indicated by applicant's admitted prior art, for the purpose of reducing the effects of musical noise, so as to improve the quality of the speech processed in the speech enhancement system.

Regarding claim 6, Bruckner and applicant's admitted prior art provide support for the SNR is obtained by a high order statistic method (col. 4, lines 40-43).

Regarding claim 7, Bruckner and applicant's admitted prior art provide support for speech is processed by fast Fourier transform to obtain noisy speech spectrum (col. 3, lines 15-46).

Regarding claim 8, Bruckner and applicant's admitted prior art provide support for noisy speech is processed by silence detection and noise spectrum estimation to estimate the noise spectrum (col. 3, lines 15-33).

Regarding claim 9, Bruckner and applicant's admitted prior art provide support for the determined clean speech spectrum is processed by inverse fast Fourier transform to obtain corresponding enhanced speech signal (col. 6, lines 23-26).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 571-272-7598. The examiner can normally be reached on Monday-Thursday 11:30-8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Angela A Armstrong
Examiner
Art Unit 2654

AAA
July 22, 2005